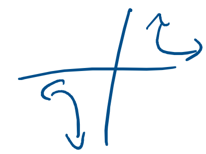
$$\lim_{x\to\infty} \frac{-12x^4+2x^2}{3x^3+3}$$

Steal highest power in numerator + ~~de~~ denominator



$$\approx \lim_{x\to\infty} \frac{-12x^4}{3x^3} = \lim_{x\to\infty} -4x \, dx = -\infty$$

Which are true?

(i) $\lim_{x\to\infty} \frac{-12x^4+2x^2}{3x^3+3} = -\infty$ ✓

(ii) $\lim_{x\to\infty} \frac{2x^2+2x+2}{-3x^2+3x+3} = -\frac{2}{3}$ ✓

(iii) $\lim_{x\to\infty} \frac{15x^5+3}{x^9+x^7} = 15$ ✗

$$\lim_{x\to\infty} \frac{2x^2+2x+2}{-3x^2+3x+3}$$

$$\approx \lim_{x\to\infty} \frac{2x^2}{-3x^2} = \lim_{x\to\infty} \frac{2}{-3} = -\frac{2}{3}$$

$$\lim_{x\to\infty} \frac{15x^5+3}{x^9+x^7} \approx \lim_{x\to\infty} \frac{15x^5}{x^9} = \lim_{x\to\infty} \frac{15}{x^4} = 0$$

Find slant asymptote of $f(x) = \dfrac{6x^2+4x-2}{3x-1}$

$$\begin{array}{r} 2x + 2 \\ 3x-1 \,\big)\, \overline{\cancel{6}x^2 + 4x - 2} \\ -(\cancel{6}x^2 - 2x) \downarrow \\ \hline 6x - 2 \end{array}$$

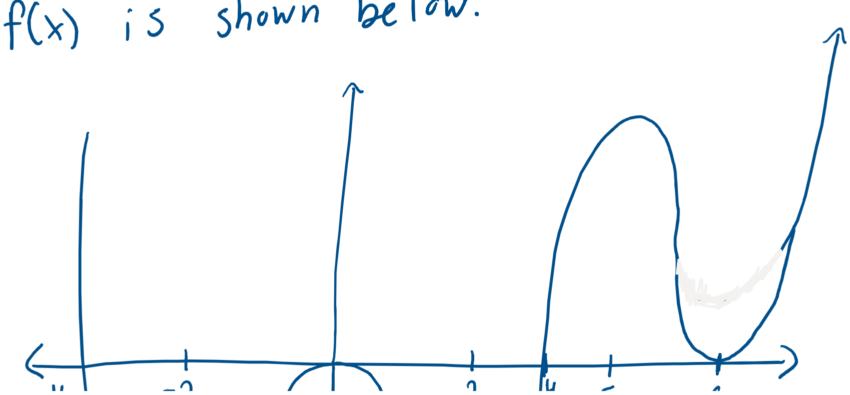
$\frac{6x^2}{3x} = 2x$

$2x(3x-1) = 6x^2 - 2x$

$\frac{6x}{3x} = 2$

$y = 2x + 2$

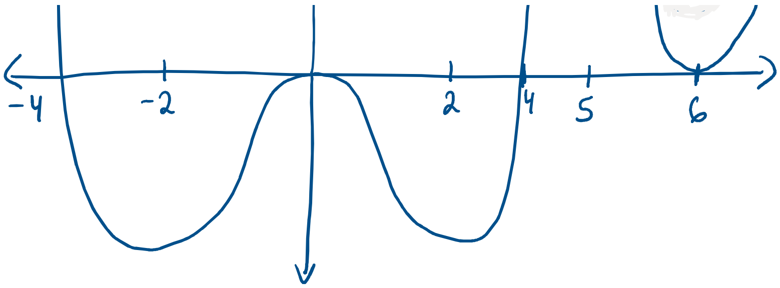
The graph of the derivative, $f'(x)$, of a continuous function $f(x)$ is shown below.



Choose the correct statement(s) about $f(x)$

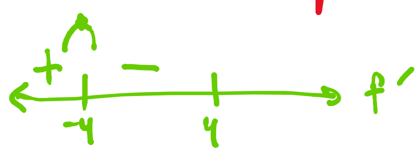
~~(i) On the interval $(-4, 4)$ $f(x)$ is increasing~~

~~(ii) $f(x)$ has 3 inflection points~~



~~(ii)~~ f(x) has 3 inflection points

(iii) f(x) has a relative max at x = -4

- f(x) increasing when f′(x) > 0 (i.e. above the x-axis)
- Inflection pt is when f″(x) changes from + − or − +
  when does the slope changes
- 

rel max or min
draw a # line.